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Development of the Queen.

BY DZIERZON.

Though I have repeatedly adverted to the subject of the period of time required for the development of the queen, I consider the topic is of sufficient importance, in a practical view, especially as regards the artificial multiplication of colonies, to deserve renewed consideration. For, if a young queen leave her cell only an hour sooner than the beekeeper supposed she would, he might find that all the royal cells which he designed to use, had been summarily destroyed.

To avoid misconception, we must first determine at what moment our enumeration of time shall begin, and to what period it shall extend. We cannot reliably undertake to begin to count from the moment when the royal cells are started, for the bees sometimes select an egg, sometimes a recently hatched larva, and sometimes one several days old; and it is, in most cases, impossible to ascertain when they commenced operations for the production of a queen. Again, not unfrequently the larva is supplied with royal jelly in such abundance as fairly to float therein, before any change in, or addition to, the cell is perceptible. To begin with the moment when the egg is hatched and the larva disclosed, is usually just as uncertain and impracticable, because for such purpose, we should have to employ a microscope, and prosecute our observations without an instant's intermission; thus involving continual disturbance of the colony, at a time when calmness and quiet are essential to the uninterrupted and natural progress of development. It would seem best, therefore, to commence with the moment when the egg is laid, provided we can assume as a fact that the brooding is duly and regularly prosecuted; because without this, there may be a difference of several days, according to circumstances, in the results of our observations, and we should thus reach widely varying conclusions.

The period *to* which we should count, is equally important, and is by no means a definite one. Properly speaking, a queen is fully developed only when her ovaries have attained their proper functions—being filled with egg-germs, some of which are so far matured that she can begin to lay. But as her fecundation is dependant on various contingencies, and may be indefinitely delayed, we may assume that her development is complete when she has attained the state of puberty. But even for this there is no fixed time, since it is greatly dependant on the variations of season and temperature, the supplies of nutriment, and the active or inactive state of the colony. Thus, under favorable circumstances, the young queen may make her hymeneal excursion as early as on the third day after leaving her cell; or, under unpropitious conditions, she may not feel any impulse to leave her hive for the first ten days, especially at a period when the workers are inclined to inaction.

A more definite and more easily determined date, is the period at which the queen has emerged from the cell, and is able to move about freely among the bees; and as this is a period of much importance in practice, it is with special reference thereto, that I shall endeavor to answer the question:—In how many days from the moment the egg is laid, can a queen be so developed and matured, as to be able to perforate the cap of her cell and emerge?

On a former occasion, I stated that the queen, developing more rapidly, and maturing about three days sooner than a worker, might be ready to leave her cell in sixteen days. Of the fact, I had no doubt, though it ever seemed to me to be

remarkably singular that the queen, which all regard as the most perfectly developed, and which, with respect to her sexual qualifications, is unquestionably such, and the duration of whose natural life extends to almost as many years as the workers, on an average, attain months, should reach maturity in a much briefer space of time than her congeners. Are we not in error when assuming so short a term? By no means. The term is not taken too short; but, on the other hand, is rather too extended. Under specially favorable circumstances, the queen does not even need fully fifteen days for perfect development. Of this, I have been convinced by an experiment made last summer, in such manner as to preclude all possibility of mistake.

In the forenoon of the 13th of June, I introduced one of my finest Italian queens into a colony from which I had previously taken a number of royal cells, and which contained only a small portion of capped worker brood. I placed her directly among the bees on the brood-comb, which may generally be done with safety when the colony has been long deprived of its queen. On examination in the afternoon, I found that no eggs had yet been laid, though it was evident from the deportment of the queen, who had been promptly accepted by the bees, that oviposition would not be long delayed, and it may have been commenced on the evening of that day. On the 17th, I removed from the hive a brood-comb containing a number of eggs and small larvæ, and gave it to a nucleus to raise queens. Now, if sixteen days are required for the development of a queen, none reared from larva proceeding from eggs laid in the evening of the 13th of June, could emerge before the 29th. But on casually opening the nucleus on the 28th, I was not a little surprised to discover a young queen already emerged, and actually engaged in attempting to destroy one of the other royal cells, which I hastened to rescue from her attacks. This was in the forenoon of the 28th. That the egg from which this queen was reared had not yet been laid in the *forenoon* of the 13th, is beyond all question, for it was *then* only that the queen was introduced. It may be asked whether Italian queens do not develop still more rapidly than the common kind? I incline to think so. I have very frequently found them emerged on the 10th day after constructing an artificial colony. A stock of common bees very rarely yields an after-swarm before the 14th day after a swarm was drummed out, or the queen removed. But if common queens ordinarily emerged in ten days, we should suppose that the after-swarm might readily issue on the *twelfth* day —though such an occurrence has never come under my observation.

And here another consideration, respecting the brooding of the eggs and the disclosing of larvæ therefrom, presents itself. It is very certain that, in the case above stated, the eggs must have been carefully brooded from the instant they were laid. This is always the case when the workers have had no brood to nurse for a considerable period, and have a large supply of pollen in the cells, and also a store of digested food in the chyle stomach. They will, in such case, feed the first disclosed larvæ so lavishly, that these float in the jelly like royal embryos.

But have the bees power to hasten the hatching of the eggs, and did they exert this in the case referred to; or is it necessary, as with birds' eggs, that a definite period should elapse before the young can pierce the shell and emerge? I am inclined to accept the former alternative. Warmth alone, certainly does not accomplish it, since, in the greatest heat of summer, unbrooded eggs remain unhatched. But in what does this brooding consist? Does it involve in its requirements the evolution of increased warmth and the aid of moisture, or does animal heat alone suffice? Do the bees contribute in any other manner to the more speedy disclosure of the eggs, possibly by moistening the surface and thus facilitating the rupture of the shell? What is the temperature best adapted to the conservation of the eggs? What degree of cold can they bear without injury?

These and other analogous questions are as yet unanswered, and beekeepers who have leisure and opportunity to make the requisite investigations, would advance the interests of bee culture, and render service to natural science in general, by laboring to solve them. They are not only interesting in themselves, but of great importance in practical bee culture. Should the conjecture submitted by some apiarians, that bees' eggs may be preserved almost indefinitely, by immersing in honey the combs containing them, the transmission of Italian stock to distant points might be greatly facilitated. Entertaining great doubt as to its feasibility, I have hitherto refrained from testing the matter by experiment.

August 30, 1861.

☞Writing to M. Dzierzon in November, 1854, we suggested to him that fresh laid eggs of bees might probably be preserved for weeks or months, without injury to their vitality, if the comb containing them were immersed in honey, and given to a strong colony when it became desirable to have them hatched. If this be practicable,

various obvious advantages might be secured. In reply, Mr. D. did not doubt the feasibility of thus preserving the eggs uninjured, but apprehended that the bees would not be able to remove the honey, afterwards, without destroying them. This might be so if the honey used were old and thick, and remained in the cells long enough to become candied; but if recently gathered, or employed while still very liquid, we should not anticipate any difficulty from this source. It would seldom be necessary to keep the combs immersed longer than six or eight weeks.

THE EYE OF THE BEE.

It appears to us questionable whether the normal shape of the lenses, in the compound eye of the bee, is hexagonal, or whether this form is not rather a necessity of growth; that is to say, we think they are normally round, but assume the hexagonal shape during the process of development, in consequence of their agglomeration. If this surmise be correct, it applies equally to the compound eyes of all insects; and our inference in this respect is drawn—

1. From the exceptional character of hexagonal or any other than circular lenses in the eyes of all animals, and from the fact of the simple eyes of insects themselves being *circular*.

2. From the circumstance that, in the insect races, the conical lenses of the ocelli (the three simple eyes of the bee), which do *not* impinge one upon another, are not hexagonal, but round.

3. Because, in the posterior angle of the compound eye of the worker-bee, we often find some of the *corneal* or external lenses of a smaller size, and not adherent, but having a little intermediate space surrounding each; and these facets are *invariably round*.

4. From the fact that in one insect at least, the sheep tick (*Melophagus ovinus*), which ranks very low in the scale of development, we find ALL the external facets of the compound eyes non-adherent and circular.

A careful examination of the eye in the pupa, whilst in process of development, confirms the opinion here expressed.—SAMUELSON.

☞Bees naturally delight to dwell in the shade, and revel in the sunshine. A Siberian forester lately found a colony of bees in a hollow fir tree, the decumbent limbs and dense branches of which completely excluded the sun's rays from the main stem. The end of a decayed and hollow root, projecting above the ground, formed the entrance of a gallery through which the bees passed in and out.

Honey.

HONEY is secreted in the nectaries of flowers, whence it is extracted by the bee, with the aid of its delicate tongue or proboscis. A portion, at least, of the harvest or gathering is retained by the insect in its crop or paunch, and this is ejected into the cells of the honey-comb, on the bee's return to the hive, to serve as a store for the winter.

This substance is so well known, that a description of it appears almost superfluous; but we may mention that pure honey is yellow, viscid, granulated, and very sweet. It contains two kinds of sugar, the one analogous to that from the grape, the other to that from the sugar-cane. It contains also a yellow coloring matter, a little wax, gum, and, according to some authors, an aromatic principle, and a slight trace of what appears to be acetic acid.

You say, therefore, that even *pure* honey is a very strange compound, and possessing, as it does, considerable value, you will not be surprised to hear that it is rendered still more complex by adulteration. This is effected by various means, some of which render it more liquid, others more solid; and if we have recourse to the microscope, an instrument that has done so much towards exposing the dishonest practices of traders, we shall find, that when honey is adulterated with sugar, there is a marked difference in the form of the crystals it contains.

There are two qualities of this product: *Virgin Honey*, which is allowed to run from the comb, and, being therefore unmixed with any foreign substance, is the purest and most valuable; and another kind that is expressed from the comb, after the first has run off.

The finest description of honey, known as pure Narbonne, is produced in the central provinces of France, and is exported in considerable quantities. It is hardly needful to add, that good honey may be found in every quarter of the globe.

Baron EHRENFELS was in error when stating that, in a state of nature, swarms avoid locating themselves in the vicinity of established stocks. Several instances are now known where two colonies of wild bees were found occupying different parts of the same hollow tree. Dzierzon, also, mentions a remarkable case, where four natural swarms, coming from a distance at different times, voluntarily entered and took permanent possession, respectively, of four compartments of a compound hive arranged for five stocks, into one of which, a colony had already been placed.

[For the Bee Journal.]

Who will Explain the Mystery?

An article with the above heading over my signature, appeared on page 206 of the Bee Journal. An exposition (?) of the "mystery" therein specified, makes its appearance over the signature of L. Pierce, on page 232 of the Journal. The remarks of my contemporary I have read with much pleasure, but must dissent from the conclusion deduced in reference to the "mystery."

The appearance of *drone-brood* in *worker-cells*, discovered by Mr. Pierce, is not at all surprising—it is precisely what might have been expected. It appears that one wing of the queen was defective, which, very probably, prevented her flight with the drones, and also that the *sealed brood* was not observed until "*several weeks*" after the queen had emerged from her cell. These facts are sufficient to justify the conclusion that this is a case of *retarded impregnation*, which usually produces drone-egg-laying queens.

We will now look at the *facts* that have reference to the "mystery:" A colony was divided; one division reared a queen; the queen was seen on the nineteenth day after the division; she was quite *young*, which was evident from her *light* color, and was not, so far as could be observed, physically defective, nor did she have the appearance of being fertilized; this same division had built a large amount of drone-comb; on the surface of one of the newly made *drone-combs*, was found a *royal cell* containing *larva* nearly ready to be *sealed* on the day of examination, which was at the same time the young queen was observed; there were no eggs nor larvæ aside from that in the royal cell. The "mystery," it is evident, is what deposited the egg, from which the larva in the queen-cell originated, in the drone-cell? Or, in other words, how came it there?

Mr. Pierce concludes that "it was an attempt by the bees to rear a queen from the drone-larva of an unimpregnated queen." From this, I conclude that he refers to the young queen found in the hive. There might be, it is true, a *possibility* that a young queen, say two or three days old, should deposit one or more eggs before being impregnated. It appears, however, to me that such instances must be extremely rare, especially when the weather is favorable and the queen not defective.

A question might arise as to the precise time when the young queen that was found, emerged from her cell. Not seeing her emerge from her cell, we can only judge from the facts given. It usually requires, in Western New York, sixteen days to perfect queens from the deposition of the eggs; much depends on the temperature. When rearing queens artificially, they have been known to be produced in eleven days; in such cases, the bees most probably select a larva some four or five days old. For the pleasure of investigation, we will suppose that the young queen, found in the colony above referred to, emerged from her cell on the eleventh day after the division, then she must have been eight days old when the examination was made, at which age they are generally fertile. From the appearance of the larva and the royal cell encasing it, I should judge that the larva was at least seven days old; then, admitting these *inferences* to be *facts*, the queen must have deposited the egg when *one day old!* I have taken an extreme case to attempt to prove the *possibility* of the correctness of Mr. P.'s deduction; but the more I investigate, the more firmly am I impressed with the belief that it is an erroneous one. I shall again, therefore, have to draw my remarks to a close in these words: "Who will explain the mystery?"

M. M. BALDRIDGE.

Middleport, Niagara Co., N. Y., 1861.

CHLOROFORM.

Chloroform has been employed to stupefy bees. A correspondent of the *Edinburgh Evening Courant* has adopted this plan successfully. The quantity of chloroform required for an ordinary hive, is the sixth part of an ounce; though a very large hive may take nearly a quarter of an ounce. His mode of operation he describes as follows: "I place a table opposite to and about four feet distant from the hive; on the table I spread a thick linen cloth; in the centre of the table I place a small shallow breakfast plate, which I cover with a piece of wire-gauze, to prevent the bees from coming in immediate contact with the chloroform. I now quickly and cautiously lift the hive from the board on which it is standing, set it down on the top of the table, keeping the plate in the centre; cover the hive closely up with cloths, and in twenty minutes or so, the bees are not only sound asleep, but, contrary to what I have seen when they are suffocated with sulphur, not one is left among the combs; the whole of them are lying helpless on the table. You now remove what honey you think fit, replace the hive on its old stand, and the bees, as they recover, will return to their home. A bright, calm, sunny day, is the best; and you should commence your operations in the morning, before many of the bees are abroad.

Historical Sketch.

BY PRESIDENT F. B. BUSCH.

Until the times of Swammerdam and Reaumur, very little of any importance or value, relative to the natural history of the honey bee, is to be found in ancient or modern literature. With them, and in consequence of their researches, a brighter era begins to dawn. To what student of natural science is the "Bible of Nature" an unknown volume; and who that has taken an interest in bee culture, is unacquainted with the "*Memoirs for the History of Insects?*" Both of these naturalists, whose investigations and descriptions are yet unsurpassed, were still, however, in error on some points relating to the bee, and failed to discover several of the most interesting facts. Both were of opinion that the queen was fecundated by the drones in the interior of the hive; and Reaumur believed that the workers were of neither sex, or neuters.

These and similar views continued to prevail among the learned till the time of Schirach, whose pre-eminent merit it was to demonstrate that a queen could be reared from worker-larva. Though this may have been known to some extent before, and have even been practised occasionally by the beekeepers in the isles of Greece, Schirach was undoubtedly the first who clearly demonstrated and widely promulgated the truth; though he, too, erred in supposing that the desired result could not be effected by means of an egg, and that the larva, moreover, must not be more than three days old.

It was at this period, also, that Reaumur's opinion, that the workers are neuters, began to be called in question. Doubts concerning this opinion, were first suggested by observing that in some artificial colonies, in which the workers had failed to rear a queen, eggs, drone-larvæ, and drones occasionally made their appearance.

The Apiarian Society of Franconia, under the lead of the Rev. Mr. Eyrich, now became active and prominent laborers in this field. Frederick Herold and John F. Steinmetz announced and advocated a new theory, one of the chief points of which, was the doctrine that some of the workers are males. This led to a controversy between the Upper Lusatian and the Franconian Societies, which was conducted with much acrimony, but left the question unsettled.

About the same time, Janscha, a teacher of bee culture at Vienna, distinguished himself by his elucidations of theory and his successful practice. It was he who first announced, as the result of his personal observations, that the young queens leave their hives to meet the drones in the open air, and that impregnation, once accomplished, sufficed to secure their fertility during life. He also rejected the theory that some of the workers are males. Under his superintendence, the Apiarian Institute for instruction in practical bee culture, established by the Empress Maria Theresa, and located at Belvidere, near Vienna, produced many excellent teachers, and disseminated much useful information. And though the captious Spitzner advanced many specious and plausible objections against the doctrines there inculcated, and professed to discredit their alleged observations, most of them were ultimately admitted to be correct. Janscha's views were adopted generally by the Austrian writers; and also by Pösl, in the Palatinate. But elsewhere, and especially by the Apiarian Society of Upper Saxony, the notions previously prevalent were adhered to and defended.

Now, the celebrated Francis Huber suddenly appeared on the arena, and attracted attention by the publication of his "New Observations on Bees," in a series of letters addressed to M. Bonnet, the naturalist. Huber's labors have been variously estimated, and we shall, therefore, advert somewhat more fully to him and his opponents. It is well known that he was blind, and had to avail himself of, and rely on, the services of his assistant, Burnens, while prosecuting his investigations. Partly for this reason, and partly because he was believed to have a lively imagination, his statements were received with distrust in many quarters. Huish denounced him as a charlatan in England, and Spitzner ridiculed and undertook to refute him in Germany. The latter published a treatise in which he recapitulated the theories and systems of former apiarians, and criticised Huber's views and observations in a highly supercilious tone. Nevertheless, many of the more important of Huber's statements were speedily verified by the investigations and experiments of other disinterested parties; and it was soon discovered that Spitzner, despite of his critical acumen and dialectic skill, was much less reliable as an observer, than the blind naturalist whom he had so violently assailed. Still, Huber was occasionally, though rarely, in error. Thus, his notion about the great annual laying of drone-eggs by the queen, and its results, is now known to be a mistake; and on some other points he was obviously laboring under wrong impressions. Though these and similar errors may now be noticed in his writings, his merits as an investigator of the habits and instincts of the bee, are unquestionably of the highest order, and consti-

tute the basis of an honorable and permanent fame.

Far below Huber, though still with fair claims, stands his contemporary Riem, who translated the "*New Observations*" into German—overloading it with his own notes and comments, which do not always evince sound judgment. It was his good fortune, however, to discover and prove the existence of fertile workers; and he contributed largely, also, by his extensive correspondence and numerous publications, to excite a more general interest in bee culture.

Spitzner, who possessed an inordinate share of self-conceit, had no clear and settled ideas respecting the sex of the bees—being uncertain whether there may not be two kinds of males among them, as there seemed to him reason to suppose that there are two kinds of females, queens and fertile workers. His works were popular for a season, but have long since fallen into deserved neglect.

Another prominent and active opponent of Huber appeared at the commencement of the present century, in the person of the Rev. W. Matuschka, a very prolific writer, who published his peculiar notions in several treatises, in 1802 and 1804. He boldly repudiated the doctrines of Swammerdam, Reaumur, and Huber, denied that the drones are males, and asserted that the true males must be looked for among the workers, though he contended that some of these are females. According to him, also, drone-mothers are regular inmates of the hive, and the queen never lays drone-eggs. He had many adherents, and, till quite recently, some of the more prominent German writers adopted his views in the main, though differing widely among themselves.

It is unnecessary to notice specially the writings of Wurster, Ramdohr, Christ, and others. They possessed only secondary and transient interest, and are of no historical importance.

Nearly contemporaneous with Matuschka, was John Christian Knauff, who distinguished himself by great practical skill and acute observation. He dissented from Huber respecting the sex of the bees; contended that the queen, in a healthy condition, never lays drone-eggs; and that these are always laid by certain fertile workers appropriately called drone-mothers. He disbelieved that the worker-eggs were individually impregnated, and claimed that fecundation affected the ovaries generally. He had not enjoyed the advantages of a liberal education, and employed others to write for him the works published in his name, and of which he is, doubtless, substantially the author. He was remarkably skilful and adroit in practical operations; and his little manual, describing his various manipulations and processes, was an interesting and popular work. Had he been Huber's assistant, he might have rendered the most important service to science. But "his lot forbade." He died poor.

The next distinguished name in the annals of apiculture, is that of the Baron of Ehrenfels, whose treatise, written in popular language and entering minutely into the natural history of the bee, has found hosts of delighted readers and admirers. He concurs with Huber as to the sex of the bees, but adopts the drone-mothers as regular members of the household. What, however, most excites surprise, is his notion that the nuptial excursions of the young queens, which Janscha, Huber, and Knauff have described, are mere preparations for the marriage, which he conceived was immediately thereafter consummated within the hive.

Nicholas Unhoch was a zealous apiarian, who made numerous observations on bees, as his book, published in 1823, with numerous illustrations, clearly proves. But with all his zeal and energy, he appears to have lacked the true observing faculty, and was unacquainted with the advances which had already been made in the branch of science to which he devoted himself. He rejected the doctrine that the queen is impregnated by the drones.

Mussehl's investigations in this department of natural history, deserve respectful notice. They are embodied in his translation of Nutt's treatise —of whose ventilating system he was an ardent admirer and zealous advocate; and he was an equally strenuous opponent of Knauff's peculiar tenets.

Klopfleisch and Kürschner also subjected the views of Knauff to strict scrutiny, and made numerous experiments to test their accuracy. They coincide with Huber on most points, though holding with Knauff as to the origin of the drones. Their treatise is interesting and valuable, chiefly as containing some satisfactory elucidations of Huber's principles. It was published at Jena, in 1836.

M. de Morlot's work on "Bee culture, theoretical and practical," appeared three years later. It adheres rigidly to Huber's views, and furnishes little besides of any value.

The latest publication, devoted exclusively to the natural history of the bee, is that of F. W. Gundelach, published in 1842, and the supplement thereto, which appeared in 1852. This treatise is the result of the author's long continued and careful observations, and, besides various new discoveries, furnishes renewed confirmation

of some of Huber's more important observations. At the time of its publication, the author was still, on the main, an adherent of Knauff; but afterwards modified or changed his views.

We close this sketch by adverting to the establishment of a Monthly Journal of Bee Culture, by Anthony Vitzthum, in 1838, which was sustained for six years, or until the death of the editor. It was succeeded by the "Bienenzeitung," which is published semi-monthly, and is edited by Dr. Barth and M. Schmidt. It is a gratifying sign of the times that, with only a transient intermission caused by the death of M. Vitzthum, a periodical devoted exclusively to bee culture has sustained itself in Germany for more than twenty years, with steadily increasing reputation and usefulness.

[For the Bee Journal.]

Kirby's Theory vs. Langstroth's.

Mr. Kirby has at last got himself and his theory into a tight place. He says, Bee Journal, p. 252, "Semen is retained in the combs from the time the drones are destroyed, at least until they appear the following season." Here is a positive assertion that Mr. Kirby has got to prove, if he wishes to sustain his theory, for in no other way can he account for the production of queens in winter, or in the absence of drones; that is, according to his theory. If semen really exists in the bee hive in winter, stored up in the combs, the microscope will show it, and I hope Mr. Kirby will employ some of his spare time, during the present winter, in procuring the necessary proof; for without it, his theory cannot stand.

It seems to me, that considerable confusion must exist in the minds of the advocates of the above "Theory," in regard to the different functions of the organs of nutrition and of generation, or reproduction, and as to these functions being in any way interchangeable. Here we have it asserted that a substance, the semen of the drone, taken into the alimentary canal of the bee, and subjected to the action of the organs of digestion and assimilation, will produce a hybrid or cross in the blood! Is not this "something new under the sun?" I know that there are some agriculturists on a small scale, who believe in "potatoes mixing in the hill." This would be a case in point, taken from the vegetable kingdom, but the fact, like Mr. Kirby's theory, needs proof. We are also all aware, that there are thousands of white children born at the South every year, who never know any other than negro nurses, and I would as soon expect to account for the existence of mulatto children in this way, as I would for an impurity in the blood of the bee, by Mr. Kirby's Theory.

Hulmeville, Pa. C. W. T.

Retention of Drones.

It has been regarded as an unaccountable circumstance that drones are retained in queenless colonies, though they are regularly expelled from those which have a fertile queen. It, however, admits of satisfactory explanation. Drones are produced and retained solely for the purpose of fecundating the young queens; and hence they make their appearance in normal colonies only at such times when either swarming may be looked for, or the death of a queen expected. So long as pasturage remains abundant, the swarming impulse prevails more or less strongly among the workers, and the presence of drones is instinctively felt to be a continuous necessity. Whether swarming will or can take place, is altogether uncertain—the issue or non-issue depending on the vicissitudes of the season. And during the continuance of this uncertainty, drones are nourished and cherished, for they may, at almost any moment, be wanted for the service of the queen of the parent stock or those of the after-swarms. But when pasturage fails or greatly diminishes, the swarming impulse vanishes also; and the drones, being then regarded as a costly incumbrance, are summarily ejected—sometimes promptly exterminated *en masse*, especially if the old queen be still hale and prolific. From the like cause also—the sudden failure, or partial failure of pasturage and consequent extinguishment of the just nascent swarming impulse—the sudden expulsion of the first hatched drones, and the entire destruction of the drone brood, sometimes takes place early in spring, even in May.

Stocks which have swarmed once in the season, and second swarms which seldom contemplate swarming the first summer, generally despatch their drones more promptly, when an unfavorable change of weather occurs, than early first swarms and stocks which have not yet swarmed.

Drones are certainly of no use to a queenless colony—tending rather to hasten its destruction; but the workers, perceiving their destitute condition, retain the drones instinctively, as of prime necessity, in case they should succeed in rearing a queen; and, ultimately, they destroy them only when they find eggs and brood in the cells—apparently regarding *that* as the evidence that they are again supplied with a fertile queen.

Sometimes, however, an evident aberration of instinct is exhibited in a colony. The workers in a queenless stock, or in one having a drone-producing queen, will occasionally expel their drones with as much zeal and system, as those of normal colonies. But these are exceptions which never occur, unless in very populous hives. The bees appear here to be self-deceived by their own multitudinous hosts; or, having an egg-laying queen, fancy themselves secure in their "hopes of succession." Colonies which have no brood, will certainly expel their drones.

Introduction of Queens.

BY DZIERZON.

One of the most important operations in practical bee culture, is the introduction of a queen in substitution for one designedly removed from a colony, or to supply the place of one that has died or was accidentally lost. Some process for these purposes generally becomes necessary in the fall, when weak stocks are to be united, and we have on hand a supply of supernumerary young fertile queens, chiefly taken from second swarms, or late made artificial colonies. If some of the stocks which are in a fit condition for wintering, contain queens two or three years old, it is highly advantageous to remove and replace them by such as are yet young and vigorous. Though a two year old queen may still be sufficiently prolific to supply an ordinary sized hive with an adequate number of eggs, a young, fertile, and undefective queen is, nevertheless, in many important respects, much more valuable. She is more vigorous and has prospectively a longer lease of life; and, if in the ensuing year, in consequence of an unpropitious season, her colony should not be able to yield either a natural or an artificial swarm, it will still become sufficiently populous to winter safely.

Of late years, moreover, the safe introduction of queens has derived additional interest and importance, from the circumstance that many beekeepers are anxious to substitute Italian queens for those of the common race, as the speediest mode of acquiring a stock of the new variety.

The customary mode of effecting the change is to remove the old queen, confine the one intended to be substituted in a suitable small cage, place her thus confined in the hive among the workers, that these may become familiar with and reconciled to her presence, and then liberate her. This process, if properly executed, and with due reference to considerations to be hereafter stated, is almost invariably successful. Yet Dr. Dönhoff has expressed the opinion that it also is a precarious operation, because bees will become estranged from their own queen, if she be thus confined, so as to assail and destroy her when again set free. This, I conceive, is going rather far; and if such an occurrence took place in Dr. D.'s practice, there must have been some special reason for it. The queen may have contracted an offensive odor from the cage in which she was confined, and was then regarded as a stranger in her own hive, and rejected. I know that in many districts, especially in well wooded countries, it is a prevalent custom to confine the queens thus when swarms are hived, and keep them imprisoned for protracted periods, to prevent the swarms from absconding; and we never hear complaints that they are killed when liberated. I have, myself, confined thousands of queens temporarily. When set free, they immediately began to *teet*, even if old and fertile, and matters forthwith proceeded as orderly as before. Only on a single occasion, was a queen killed for me by her own bees. I confined her early in the morning, intending to send her off in the afternoon. She was destroyed when set free; but I suspect she had contracted an odor strange to her workers, which she derived, probably, from another queen which had just previously been confined in the same cage. Or she may possibly have been unintentionally stung. If a confined queen is impatient and restless, and emits tones of alarm or fear, the bees will become violently excited, and project their stings in their efforts to get through the bars of the cage, for the purpose of surrounding and protecting her. She may thus accidentally be fatally wounded, in a struggle meant for her defence. But if the queen be quiet and calm, as old queens usually are, the bees will remain as perfectly content while conscious of her presence among them, as though she were at large in the hive. But as all this cannot be foreseen or foreknown, it is best not to confine a queen, unless for special reasons it be indispensable. But when introducing a stranger queen, confinement is always a prudent precaution. I would not advise placing her, unprotected, among bees recently deprived of their own queen, even when, by commotion, they give evidence of full consciousness of their deprivation. If the removed queen was still sterile, a fertile one will readily be accepted; but even in such case, the substituted queen should previously be *besmeared with honey taken from the open cells of the bereaved colony*, or the peculiar odor which attaches to her, may induce a hostile and probably a fatal attack. But a colony, deprived in the spring of a fertile queen, in whose company the workers had passed the winter, will always prove exceedingly obstinate and intractable on such occasions, and require particularly careful management. Huber and Reaumur differ in their statement respecting the deportment of bees towards a strange queen, chiefly, I suspect, because they experimented with colonies differing from each other in condition and, of course, in character—the effects of such difference being unknown to the experimenters. It is an important consideration, too, whether the bereaved colony remains in its own well stored

hive, or is transferred to an empty one. In the latter case, the bees will feel embarrassed, and be much more disposed to accept a strange queen, than in the former. When remaining among their own stores, even if there be no eggs or larvæ remaining in the combs, the bees will sometimes rally round an old royal cell, though empty, and obstinately refuse to accept an offered fertile stranger. They regard themselves as "lords of the manor" when in their own hive; but in an empty one, they soon feel that they are themselves strangers and sojourners, and the result is a corresponding change in their deportment. If, moreover, the bees have been collected from different hives or swarms, which have long been queenless, or are taken from bereaved stocks, from parent hives which have lately swarmed, or from second swarms whose queens are yet unfertile, they will readily accept any queen, though more especially a fertile one, as soon as they have become conscious of their destitution—and this, whether she be offered to them with or without previous confinement. The most suitable period for introducing an Italian queen is, consequently, the swarming season, particularly when second swarms are issuing. If the beekeeper cannot rely with certainty on the issuing of second swarms, and is unexperienced in drumming out swarms, and unskilled in removing queens, all he has to do is to cause a large proportion of the bees of a first swarm to return to their parent hive, by forming a nucleus with the queen and a few hundred workers, and placing this temporarily in a cool cellar or dark chamber. Or the parent hive may be transposed with some other populous colony. After-swarms may then be confidently expected. But it is not necessary to await their appearance. The bees may be drummed out within a few weeks after, before any young queens have emerged; and we thus obtain a body of workers, which, unaccustomed to the presence of a fertile queen, and being now suddenly transferred to an empty hive, they feel completely nonplussed and are ready to accept any queen, whether Italian or common, which may be offered to them. Should the drumming have been delayed till a queen has left her cell, she must of course be removed before the one we desire to introduce is offered. The bees may be left in the unfurnished hive till the following morning, and then transferred to one containing combs, if such be at hand. They will, meantime, have become fully reconciled and familiar with the given queen. If not sent to a distance, the hive must be set where the parent stock stood, and the latter moved to some other place. The queen will not be endangered by the bees which may leave the parent hive and unite with the driven swarm, for the parent stock is still either queenless, or has one yet unfertile, for which the bees feel no attachment. All this is much more speedily and more easily accomplished, where movable comb hives are used; for it is then an easy matter to take out some of the frames, and shake off into an empty hive as many bees as may be required for our purpose. My own practice, however, is to remove the queen, and a week or ten days later destroy all the royal cells, or take away the young queen which may have emerged. Two or three days later, I again examine every comb carefully, and destroy any royal cells that may have been started; and I then feel confident that an offered fertile queen will be accepted. Yet, I regard it as judicious to confine the queen for a time; for even if the bees should not manifest any hostility towards her, she, feeling herself a stranger in the hive, may hasten to leave it and be lost.

(For the "Bee Journal.")

ANTS.—TO KEEP AWAY FROM HIVES.

When hives are properly constructed, ants cannot get into them to propagate their young. They frequently, however, get into hives in consequence of not being properly constructed, and do much injury, as they annoy the bees, injure the hive by eating into the wood, and will eat the honey if accessible. It is very little trouble to drive and keep the ants away from the hive, although much trouble has been experienced by many, for the simple reason that they knew no remedy. *To drive the ants away from the hive,* or out of their retreat, direct upon them a small quantity of the smoke of wood or tobacco. Each one will usually shoulder a number of their young, and "secede" *instanter! To keep the ants away from the hive,* apply, as soon as they have mostly disappeared, thinly in places where they frequent, with the feather part of a quill, the *spirits of turpentine;* they will not be seen again, in general, during the remainder of that season; but should they return, repeat the application. This preventive is very simple as well as efficacious; try it.

M. M. Baldridge.

Middleport, Niagara Co., N. Y., 1861.

One square inch of *worker* comb contains about 25 cells on one side, on both, 50. Hence, a piece of comb 4 inches by 5, will contain 1000 workers.

One square inch of *drone* comb contains about 16 cells, and on both sides 32.

The cells of workers are 7-16 of an inch in depth, and drones are 9-16.

[For the "Bee Journal."]

A Successful Wintering of Bees.

As the season has come round when the careful apiarian looks well to the comfort of his little busy friends, the writer is reminded of his success last winter, and gives his experience for the benefit of those who have as yet no settled plans for the better preservation of their bees during the cold weather.

The writer's hives have movable combs. The size is 14 inches every way on the outside, and each one is placed by itself upon a small platform, close to the ground. On the top of each hive are four holes for supers. The cover which goes over the supers, is large enough (say 14½ inches in the clear) to slip over the hive, and when the supers are off, covers the hive completely, and still leaves two or more inches space between the top of the hive and the top of the outside cover. (In summer, this same cover is raised sufficiently to place supers under, and rests upon cleats, which are screwed on to the four sides of the hive at any height desired.) Last winter, the writer opened one of the holes in the top of the hive, and tacked wire-cloth over it, and then put on the cover (or surtout, I call it). The opening made in the cover, to correspond with the entrance to the hive, when slipped wholly down, is not more than 1½ inches long, and ½ inch high. Thus, no great current of air can blow into the hive, and the moist atmosphere rises through the hole in the top, instead of collecting dampness in the hive.

The writer was never so successful in wintering his bees as the last season. Upon raising the covers in the spring, instead of a damp mass of debris, and large quantities of dead bees, the floor was dry, and the caps of the cells lay along in regular order under the spaces between the combs —showing that the bees had not moved much.

The number of dead bees was much less, and evidently those which had died a natural death—not the sleek, whole winged ones, but dark, jagged-winged, *hard* workers—perhaps a half tumbler full in each hive.

Though the *size* of the hive is here given, it is not necessary that it should be adopted for the better preservation of the bees. The *principle* can be followed out by any using the square box hive, common among farmers. Another advantage in connection with this arrangement is, that if the bees fall short of honey, they can be readily fed.

One of my hives (about February) had not a drop of honey in it. I filled a tumbler full of plain barley candy, and inverted it over one of the holes, and the bees leisurely consumed it all. One pound (cost 25 cts.) carried them through till the time of fruit blossoms, when (the weather being favorable,) they laid up sufficient to last till the white clover came.

Will not some others give their experience respecting this most important matter of keeping bees through the winter?

And oblige APIS.

[For the Bee Journal.]

I have kept bees in the upper part of the city of New York for many years, where they steal from sugar houses and groceries, and my experience does not agree with that of the beekeepers on the banks of the Oder. A sugar refinery within range of an apiary would, in my humble opinion, prove very destructive, unless so arranged that bees could not get at the sugar. The number that lose their lives in obtaining food from any source except flowers, more than balances any temporary gain by those who succeed in regaining their hives.

Most insects show a commendable degree of caution in alighting upon a vessel of fluid; but the bee, eager upon plunder, pitches headlong in, and the chances of a safe exit are sadly against him. In open air feeding, the feeding troughs have to be made with special provision to guard their lives, and even then many get bedaubed and never regain their home.

The propensity of the bee to seek food from illegitimate sources, varies very much at different seasons of the year, and depends mostly upon the yield from natural supplies.

In transferring bees and comb, when bee pasturage is abundant, no trouble is experienced from robbers; but, at other times, the operation is attended with great risk to the swarm, and annoyance to the operator. When there is a lack of flowers, examinations involving an exposure of comb should not be undertaken, except either very early in the morning, or after flying has ceased in the afternoon,

I have observed that a queenless hive will decrease more rapidly in the city, within reach of sugar houses, than in the country. One can generally tell whether his bees are obtaining their supplies from refineries or from flowers.—If from flowers, they return looking clean, and the strength of the colony is maintained or on the increase; but if actively engaged in robbing, many return bedaubed and they decrease rapidly. This does not apply to robbery of other hives in which they do not get soiled, and the chief loss is in the first conflict. E. P.

Age of Bees.

Many people say bees only hive six months; now, I have two hives, to each of which I introduced a Ligurian queen, by fumigating them in July, 1860. In October, I bought a swarm that had been already fumigated to take the honey; I fumigated it to take the queen away, and then added to it one of my Ligurian queens to strengthen her. Now, this is the 16th of September, and there is not only a large number of English bees in the Ligurian swarms, but also a great number in the old stocks, the Ligurians having swarmed—one twice and the other (that from which I took the Ligurian queen to add to an English stock) three times. Now, here is a large quantity of bees alive that must be more than a year old, and not only are they that age, but many of them have been fumigated twice. As I am not clever enough with bees to take the queen away without fumigation, I generally use it, and have found, when carefully done, very little loss, and after a day or so the bees seem to have quite recovered.—*London Field.*

Before the above can be received as evidence of the life of the worker exceeding one year, the writer must prove that the "English bees" in his Ligurian colonies are not the progeny of his Ligurian queens, and also that they have not wandered in from English stocks, if he have any standing near them. It is well known that young workers sometimes enter a strange hive, and are kindly received and remain attached to their new home. Drones, especially, are not particular where they "put up." In some of my colonies that received Italian queens sixteen months ago, there are still a few bees that have no yellow rings, and are not distinguishable from the common black bee. These hives contain also more or less dark-colored and imperfectly marked workers. The mothers may be hybridized, notwithstanding a majority of their progeny are perfect in their form and marks. These colonies have as many apparently black bees now, as they had six or eight months after the Italian queens were given them, and I think the same will be the case during the life time of these queens, and that the "black bees" are their progeny.

I introduced an Italian queen to a strong colony, August 24th, 1860. I examined the colony frequently during the months of June and July, and could not find any black bees among them; all were perfectly and uniformly marked, differing a little in brightness, according to age. This colony was in an isolated position. I removed the queen in July, and allowed them to hatch a queen from her eggs. In October, I examined the colony and found some "black" bees, evidently the progeny of the young queen, but many of the young bees looked pure. I have raised, at a friend's apiary, some half and quarter-blooded Italian and black bees, for the purpose of seeing the effect upon their markings; but this is not the place to enter upon a statement of the results.

Of Fumigation, the writer says—"After a day or so, the bees seem to have quite recovered." It is unnecessary and cruel to smoke bees to such an extent—when properly done, they ought to recover in a few minutes, and be able to go on with the labors of the hive as if nothing had been done to interrupt them. The less smoke used, the better, if searching for a queen. In uniting colonies, more smoke may be used. E. P.

Bees and Flowers.

The double stock, or double flower, having its seed vessels and parts of fructification transformed into petals, either by a diseased seed, or excess of nourishment caused by rich earth, cannot perform its duty to nature by replenishing its species by seed. This beautiful though unnatural flower would, therefore, soon become extinct, were not florists careful in sowing the seeds of the single or natural flowers growing near those which have double blossoms. On examining a number of the double blossoms, we sometimes find a single anther concealed between the petals, the fecundating properties of which, although as infinitely small as the pestilential particles in the air, are sufficient to carry disease to every pod of seed, the stigma of which it shall have passed over, either by the aid of the air, or the accidental assistance of insects. Bees and other insects which live on the nectar of plants, seldom rest on flowers that have become so double as to exclude the parts of fructification, because there is no honey or nectar where there are neither anthers nor stigma. But if a single anther be growing in a double flower, the bees are sure to discover it, and thus they convey the pollen to more perfect plants; since nature, which is so perfect in all her works, has not inclined the bee to luxuriate indiscriminately from flower to flower of different generas, for then would the pollen of the melon be wasted on the stigma of a rose or a poppy; but these industrious insects may be watched from blossom to blossom of every variety or species of a plant, without touching on one of a different family. Thus, one bee will be seen collecting from the natural order Cucurbitaceæ, whilst a second is rifling that of Rosaceæ, and others that of Labiatæ, &c.: and Jussieu himself is not better acquainted with the affinities of plants, than are the bees and other insects which feed on the nectar of flowers.—PAXTON.

From Dr. Donhoff's "*Contributions to Bee Culture.*"

WHAT IS THE MAXIMUM OF POPULATION TO WHICH A COLONY MAY ATTAIN?

1. Under favorable circumstances, in the most genial season of the year, the queen-bee may certainly lay three thousand eggs a day. If we assume this as the *maximum*, and furthermore that she can continue to be thus prolific during six weeks or forty-two days,—or—naming a definite period—from the 1st of June to the 12th of July inclusive, there will issue from the cells three thousand young bees, daily, in the interval from the 21st of June to the 2d of August inclusive; and the colony would thus, if for the present we disregard casualties, contain 126,000 *young* bees on the 2d of August.

2. The average duration of life of the bees existing in a colony during a conterminous period, is, in the summer, about six weeks.* I have satisfied myself, by observation of Italian bees this season, that this estimate, first made by Dzierzon, is substantially correct; for the common bees remaining in a colony, at the end of six weeks from the day an Italian queen was given to it, were relatively so few in number as not to be worth taking into account.

These assumptions I regard as reasonable, reliable, and warranted by the observations of the most competent beekeepers.

Cordially approving of the accurate mode of conducting investigation—which the Baron of Berlepsch, following the example of Huber, has the merit of re-introducing in apiology; and which does not content itself with mere *a priori* reasoning, but strives to give the precision of number and measure to the observed facts recorded—I stupefied a swarm of bees just issued, and measured it accurately in a glass vessel. Three weeks thereafter, just before any brood had left the cells, I stupefied and measured it again. The result showed that less than one-third of the original quantity remained in the colony.

Accordingly, if we assume that the average duration of life of *a generation* of bees is six weeks, the colony in which 126,000 bees were hatched within the six weeks preceding the 2d of August, will no longer contain any of the older bees, or such as were hatched prior to the 21st of June. Nor will the whole of the 126,000 young bees be still in existence, as is manifest from the following considerations:

If the conterminously produced mass of bees, or to use a briefer expression—*a generation*, dies out in six weeks, then, of the 126,000 bees which came into existence successively in that period, one-half will have perished at the close of the term; for the medium value of the life of the bees is only half as great at the end of the term, as that of an entire generation. The age of a bee hatched on the 21st of June, will, on the 2nd of August, be 42 days, while that of another, hatched on the 2d of August, is 0 day—the middle term, therefore, is 21 days.

A bee hatched on the 22d of June, will be 41 days old on the 2d of August; and a bee hatched on the 1st of August, will be one day old on the 2d of August. The aggregate of the ages is 42 days, and the medium age is the half thereof, 21 days. Now, if we conceive the several ages of the bees in the colony to be an arithmetical series, we shall readily see that the middle term of this series is also 21 days.

The medium age to which the 126,000 bees would have attained on the 2d of August, is, consequently, 21 days; while the medium term of the ever-diminishing mass of bees constituting the colony hived on the 21st of June, will, on the 2d of August, or in this period of six weeks, be 42 days—none of them then surviving.

Now, if at this busy season, all the bees of a colony severally perish in 42 days, then only one-half of the whole number hatched since the 21st of June, will be dead on the 2d of August. Only one-half of the term allotted to a generation having elapsed, the bees will have made only one-half of the whole number of life-perilling excursions, and have encountered only a moiety of the casualties to which they are necessarily exposed. Hence, of the 126,000 young bees hatched, one-half will have perished before the 2d of August, and 63,000 remain living on that day.

But if, of the 126,000 bees hatched, 63,000 perish in 42 days, the average daily mortality or loss is 1500. Now, as the existing stock of bees may be conceived of as an arithmetical series; and as the increase of life-perilling excursions, and the consequently resulting losses, likewise constitute an arithmetical series; and as the first term of this series is 0, the middle term 1500, and the last term 3000, it follows that on the 2d of August, the daily loss will have reached 3000. Hence, from the 2d of August (or did the prolificness of the queen remain undiminished), the daily loss and gain respectively would balance each other; and there would thenceforward be neither increase or diminution of the aggregate number constituting the colony. Thus, we reach the conclusion that 63,000 bees is the *maximum* number which can, in the most favorable circumstances, contemporaneously exist in a colony, *as the progeny of a single queen.* Such is, consequently, the largest extent to which the population of a single colony can at any time attain, by natural process.

*In a colony having a queen that lays 3000 eggs daily—a degree of prolificness which presupposes an abundance of pasturage, and great activity in gathering honey and pollen, and of course a correspondingly great destruction and loss of bees—the average duration of life may be considerably less.

Bee Culture.

[We copy the following from an article on bee-keeping, written for the Patent Office Report for 1860, by Mr. William Bruckish, one of the earliest, most earnest, and most energetic advocates of the Dzierzon system. For years before leaving Germany, he labored indefatigably, spending his time and money freely, to bring that system to the favorable notice of the people and the governments, particularly in Prussia. Though his motives were then ungenerously impeached, and his efforts thwarted in many quarters, he is now frequently referred to with due appreciation and respect. It was understood that he left his fatherland with the hope of retrieving his impaired fortune in this country. How far he has realized his expectations we have not learned; but fear that in these troublous times, with such *waspish* elements all around him, he may, amid his most peaceful pursuits, have suddenly been surprised by finding his head in a *hornet's nest.* The article from his pen, though marked by quaintness of style and foreign idiom, and prepared with constant reference to Texas and the South, is, on the whole, incomparably the best essay on the subject of which it treats, that has appeared in the Patent Office Reports. Some of the previous papers—especially those which were done up so *brown*, are very precious reading for a beekeeper who seeks amusement, and delights in funny theories or amazing novelties.]

OBJECTIONS TO BEE CULTURE.

Numerous prejudices exist injurious to bee-raising, some of which require particular refutation, as most frequent, and having apparently so much weight with many persons: First: It is alleged that bees yield no profit, or at least so little that they will not pay for keeping; and, as to the increase of national wealth, that their yield is hardly of any importance. Secondly: It is said that, in view of their propensity to sting, it is always a risk, and even danger, to keep bees. Thirdly: It is affirmed that it is too difficult, and requires too much time, to give the bees such a management as is most conducive and natural to them.

As to the first objection, it is true that no revenue can be expected from an irrational and unnatural treatment of bees. But wherever this industrious little creature has been properly cared for, during a tolerably fair season, in countries which are not wholly deficient in honey plants, they have always yielded their keeper a corresponding return, not only compensating him for his time, but also blessing many a bee-raiser with prosperity. The question, however, is a more serious one, whether individuals or whole families can derive their principal support from bee culture. Even this question can be answered in the affirmative. In Germany, there are no places altogether destitute of honey, but in this country, both extremes may sometimes be met with, for there are sections suffering from prevailing dryness, where neither trees nor shrubs will grow, and where the bees must of course starve. Again, there are other sections, and these form by far the greater portion of the country, abounding in honey, where the bees can collect only the smaller part of this abundance, no matter how much they store away. In dry places and poor seasons, the bees are reduced to a mere handful around the queen, and they will even cease their excursions for honey, as useless. These hard times, in our hot climate, usually occur in midsummer, while in the northern parts of the United States and in Germany, many hives are killed by cold and want of food. Many hives there, too, after consuming a large quantity of honey for several months, will starve, though a little more would have saved them, which, however, during great cold, it is difficult to give them. The conditions for bee culture in this country are, on the whole, quite different from those of Germany. Wet summers there, with cool weather, cause the ruin of bees, however beneficial they may be to the field crops. Dry summers, on the contrary, are more favorable to them, because the drought, unless very protracted, instead of diminishing their food, only tends to increase it. But in this southern country, here in Texas, where dryness is usual, the rainy seasons are a real refreshment to man, animal, tree, and every other product, and especially so to bees. While in the Northern States the spring, including June and half of July, forms the main period for gathering honey, this is done in the fall at the South. During good weather, the bees here gather from January to August only what they want for their own use; while during the three months of September, October, and November, they gather all their surplus for man. Many a hive with us, in Texas, containing but a handful of bees in August, requires only sufficient rain to become populous again within three weeks. In three weeks more, every part of the hive will be filled up, while if it should enjoy favorable weather for two or three weeks more, every space that has been emptied, will be again filled with a second crop. Generally speaking, the South is far more adapted to the bee, than the North. Though an oppressive heat

is not favorable to it, even if it rest a little during the warmer hours of the day, yet cold is much more injurious, frequently causing destruction. While it is well known that the bee can live at the equator, it is not yet ascertained how far north it may do so. In Sweden, it still prospers, and affords a surplus of honey.

The most favorable conditions for bee culture, are found in those countries which combine great warmth with sufficient humidity; where none of the millions of blossoms is deficient in its nectar formed from the abundance of juice, but which is almost wholly wanting in dry and unfruitful regions. The nectar of the blossoms, as well as the pollen, form the only food of the bees, with the exception of the honey dew, mainly the product of the aphides, and which the bees gather from the leaves of the linden, the chestnut, the oak, and other trees. That bee culture in the South pays a larger profit than at the North, is shown by the fact that each colony at the North requires at least from fifteen to twenty pounds of honey as food for winter, while at the South it hardly requires five pounds, being about fifteen pounds less, that may be counted among the profits of the bee-keeper. As regards the annual yield, figures will also here decide, as in other cases. A colony, including the hive, which in many cases is almost worthless, is sold here (in Texas) for from five down to three and often two dollars.

Whether the price be high or low, the profit will be at least 100 per cent. in case a new colony or swarm be obtained. But in favorable seasons, two swarms, either natural or artificial, may be expected from a hive. The intelligent practical beekeeper may annually raise ten new colonies, in this favored region, from one old stock. But the question is whether the supplies of nature will nourish and support his weak colonies. This will certainly require that they be located in a district extraordinarily rich in honey, such as the writer has never known. Dr. Blumenau, of Brazil, stated in 1852, that more than a dozen swarms had issued in a season from one single hive in that country. Such an increase might be possible in a very rich locality, and Dr. Blumenau is a reliable authority, as the moderation of his other statements shows. At a distance of only thirteen miles from the writer's residence, a beekeeper (M. Spangenberg) has hived eight natural swarms from two old stocks, while three escaped under his own eyes, and judging from certain circumstances, probably three more absconded unnoticed. These make fourteen swarms from two old colonies, a sevenfold increase; and this in a stony and sterile region, of which only a small portion is susceptible of cultivation. Five of these eight swarms stored up a considerable quantity of surplus honey during their first summer.

The yield of honey annually produced by one hive in the north of Germany will, on an average, hardly exceed ten pounds, unless the summer is unusually favorable; but in the United States, at least at the South, and this in dry localities, as in Western Texas, there are but few years when a stock, on an average, yields less than twenty pounds a year. It is true, there are also colonies which have lost their queens, or which have become weakened from some other cause, and have not saved anything for the coming year, except their lives and their health. But such are brought into the average, by the prominent hives yielding one hundred pounds of honey, and over; for, a vigorous colony in a suitable hive, and enjoying a favorable season, will here sometimes yield as much as two hundred pounds a year. Estimating the price of honey at only fifteen cents a pound, the yield of the average amount of twenty pounds, is three dollars, or seventy-five per cent. of the purchase money at four dollars per hive. From this, the cost of management and other incidental expenses must be deducted This amount, however, is inconsiderable, and diminishes in proportion as this branch of industry is extended. If bee culture is practised on a large scale, the value of the time devoted to it is divided among so large a number of hives, that it is employed to advantage. The very fact that one individual is enough to keep so many hives in order, has a great deal of weight in this question. Under the hands of a man ill-fitted for his business, not even a small number will thrive, while the intelligent practical beekeeper can take care of five hundred, and make, besides, a portion of the hives needed for new colonies. Should he require assistance during the period of swarming, it will be but little, and only for a short time. What branch of agriculture can show such another instance of one man making by his labor over one thousand dollars a year, clear gain?

The most natural and profitable way of keeping bees, is for every farmer to put up as many hives as he may want for producing his own honey and wax. With sufficient assistance, the intelligent and thorough bee-master can keep a thousand hives, and even more. Many a person may be deterred from such an increase, by the cost of the hives; but he should consider that the increase is only gradual, so that the beekeeper will be prepared for it when the expenditure becomes necessary. Even an expensive bee house may be doubly paid for from the profit of the honey

obtained the first year. Besides, a large number of hives can be more economically put up, than a small one; if the first hives, for instance, should cost two dollars, the last ones will not be more than one-fourth of this amount. A small number of colonies require good and substantial hives, while in a large apiary, a considerable proportion of them may be of less substantial construction, to serve their temporary purpose.

From two hundred to five hundred colonies may be sustained on the square mile, as the nectaries of the flowers are replenished very speedily and frequently in favorable weather. In very unfavorable weather, however, even a small number will suffer. Yet it is certain that with proper management of the bees, the country can not only produce a sufficient amount for its own consumption, but its surplus may also enter largely into the articles of export, adding much to the increase of national wealth and prosperity. Here the question very properly arises whether Nature's stores of honey, which are so rich on this continent, should be collected, as can be done with so little means, or whether thousands upon thousands of tons of honey should be lost. How many colonies might be kept, and what a vast amount of honey and wax might be produced throughout the whole country, may be seen by a glance at its extent, or noting the number of square miles, deducting the barren tracts, which are destitute of all bee food. All that the bee-raiser requires is a simple habitation for himself, room and fencing for his hives, and dogs to secure them from injury by cattle or from thieves. Bees neither require any soil adapted to cultivation nor pasture land, like cattle. Even the so-called waste land, as swamps and rocky tracts, will add to their sustenance, though nothing grows on such places but marsh plants, shrubs, or trees. They can do without agriculture and population, the latter not being desirable on account of too much intercourse and interference. The neighborhood of large cities, or a situation within a moderate distance of railroad communication, offers the beekeeper a good market for his honey, especially while yet in the comb. The vessels required in his operations are few—a boiler and some honey casks—and are not nearly as expensive as the apparatus required for the manufacture of sugar, syrup, or other products. The wax, after melting, requires no peculiar packing; it can only be destroyed by fire, and never deteriorates.

The second objection— that, on account of their tendency to sting, it is risky and often dangerous to keep bees, is without foundation. The puncture, as is well known, is the wound caused by the sting, and is accompanied by swelling. The swelling is the result of an acid similar to that distilled from the ant-hills, and contained in a vesicle at the root of the sting, from which it is poured into the wound. The bees of Germany, it is true, are often quite malicious, but those here in the South are really of a good-natured character. One may manage them for days, may produce artificial swarms, take away their honey—in short may undertake any operation with them without being stung. But suppose they were even worse than those in Germany, it would not form any really serious objection. To avoid their stings, however, the bees should neither be pressed nor squeezed; they should not be breathed on, nor should there be any jarring about their hives; and all rapid movements in front of the hives, and quick motions of the hands, must be avoided. It is said that bees are irritated by the disagreeable sweat of man; but the writer has never noticed it. This would certainly be bad, as the labor required in the management of bees cannot, at all seasons, be performed without causing perspiration; especially is this the case when hiving natural swarms during the hottest part of the day. A quiet and fearless treatment of bees is indispensable. Smoke is the most effective and seldom failing means of keeping them in due restraint. The old bee-masters always employed their earthenware smoking pot, sometimes increasing its effect by a small bellows attached to it. It was by using this implement, protecting their hands with gloves and their faces with a bee-cap, that beekeepers formerly ventured to approach their bees, performing all their operations under this oppressive shield, though they had to perspire profusely under the bee-cap, and could not see distinctly.

The Rev. Mr. Dzierzon and his followers have entirely banished the bee-cap and the glove. Instead of the smoking pot, they make use of a burning segar, or a little lighted stick of decaying linden or maple wood, the smoke of which can easily be blown by the mouth to whatever spot required; it being enough to blow a little smoke occasionally among the bees. Where no such decayed or decaying wood can be got, a bunch of rags is used. The glowing end of such a lint-stick must be dipped in water, or buried in the ground after use, so as to avoid any danger of fire. The smoke benumbs the bees; yet if enraged by a violent shock, by many being crushed, or by a hive being upset, the strongest smoke will avail little, and the beekeeper has no alternative but a speedy retreat, to allow the bees to become calm and quiet. The Italian bee does not exhibit such violence of temper; she stings only when pressed or irritated

in the highest degree. The mild character of this bee, not to mention its superior industry, renders the introduction and extension of this race important, as the fear of being stung, though often groundless, deters many from engaging in the enterprise of bee-raising. In the progress of his management, the bee-raiser will have acquired so much skill and practice that, even in an extensive apiary of 100 hives, he can readily discover and catch every bee disposed to sting. He distinguishes it by the peculiar sound it emits when buzzing about him, and strikes it to the ground with the palm of his hand. Among hundreds of humming bees he will soon recognize the tones of that one, more or less distant, which is disposed to sting. Sometimes the pain resulting from the sting is quite severe, but generally produces little inconvenience and gradually the human system becomes accustomed to the virus, and no bad results follow the infliction. On being stung, the sting should be immediately extracted, and the wound anointed with spittle, wet loam, olive oil, sal-ammoniac, alchohol, or vinegar, whichever is most conveniently at hand. The pulp of a pear may also be pressed on the wound—an experiment tried by the Rev. Mr. Fischer, of Kaaden, Bohemia, who after being stung by three bees on the point of a finger, immediately took a pear from one of his trees, laid open its flesh or pulp and pressed his finger against it. The pain almost instantly ceased, and no swelling ensued. It might be inferred from this that other fruits may prove equally serviceable. Nobody could have betrayed more fear than the writer as a new hand; but now he looks upon the sting of bees with indifference, as will every practical beekeeper; and the subject has been treated of here in such detail only because most persons attach so great importance to it.

As to the third objection, that to obtain a knowledge of the proper treatment of bees requires too much time and is too difficult, it may be remarked that these difficulties are but imaginary. Many persons are afraid of approaching a bee hive. They think that they cannot hive a swarm of bees, or take the surplus honey, &c., looking on these operations as requiring much skill, while devotedness to the object, and courage are alone sufficient for the performance of this kind of work. Let the beginner first read some good work on bees (he will soon discover the errors of many books by comparing them with better ones), observe the manipulations of practical beekeepers, as well as put up hives himself, and manage them fearlessly, and he will in a short time acquire skill to perform everything necessary, often even better than he sees it done by others.

As to the time required for gaining a knowledge of beekeeping, all operations consume the less time, the nearer they approach nature. This is true particularly with the Dzierzon method. Based on the natural history of the honey bee, it implies facility and simplicity in the treatment and habitation of bees. The hives should be as simple and cheap as possible, so as not to reduce the profits of the yield. All artificial and expensive hives should, therefore, be banished, and every beekeeper be able to make his own hives.

Among the means best adapted for the promotion and general distribution of bee culture, instruction and practice rank highest. There are already many good bee manuals published; the influence of which, however, should be increased by the establishment of a special JOURNAL for bee culture and model apiaries. From the importance of bee culture, in respect to national economy, model apiaries ought to be established by both the National and the State governments. Such model apiaries might be attached to the Agricultural Division of the Patent Office, under the management of a special bee-master. The object of such a model apiary would be to promote bee culture, not only by distributing swarms and queens, but by diffusing practical knowledge among the public at large, and generally by serving as a bee school to teach by practical demonstrations, the natural history and habits of the bee, and to show all the operations and manipulations in bee-keeping; as, for instance, the production of artificial swarms, hiving, taking honey, &c.

The object might be still farther secured in establishments of a similar character, in connection with the several State Agricultural Schools, or other similar institutions. Such establishments, based on the results and experience of modern investigations, and the principles laid down by Science herself, and by recognized masters in this branch of industry, should be conducted only by intelligent and practical men, who, by long experience and study, have become thoroughly acquainted with the progress made in bee culture, and its present condition. To any objections against such model or experimental apiaries, on the ground of expense, it may be replied that they would not only sustain themselves, but, beyond the great object to be attained—the general promotion of bee culture throughout the country—they would furnish a rich revenue from their products.

AMERICAN

Beekeepers' Association.

Semi-annual Meeting held at Cleveland, Ohio, November 21, 1861.

The Association convened in pursuance of a call of the Executive Committee, President KIRTLAND in the chair. In the absence of the Secretary, J. C. EBY was appointed Secretary *pro tem.*

There being no Committees to report, on motion of E. T. Sturtivant, a Committee was appointed to prepare business and propose subjects for discussion. The Committee consisted of Messrs. E. T. Sturtivant, C. H. Robbison, and W. A. Flanders, who reported the following questions for consideration, viz:

1. What is the best mode of wintering bees?
2. What is the best manner of feeding bees, in every form?

Opportunity being given for persons present to become regular members, Messrs. C. H. Robbison, Lewis Twining, of Indiana, R. H. Chopin of Michigan, Col. C. J. Sanders of Kentucky, Dr. V. S. Silvers, Mr. Judson, A. Beebe, David Morrison, and Alvah Udall, complied with the rules, and were received as members.

The discussion of the first question was then opened by Dr. Kirtland, and continued by Messrs. Brown, Twining, Sturtivant, Flanders, Cunningham, Smith, and Eby.

Dr. Kirtland said he had wintered bees in various positions. Two years since, he had wintered them in hives standing out doors. If stocks were rich in stores and had plenty of bees, he should let them stand out. Last winter, he put some light stocks in a very dry cellar, where they wintered well. He would prefer to have them front towards the north, or placed in the north side of a building or fence.

Mr. Brown preferred to bury his bees in the most simple manner, which he described, giving them plenty of upward ventilation.

Mr. Twining could not think of burying bees at all. It was not natural. He wished to have them placed on the north side of a building or fence, with ventilation at bottom and top; and so arranged that he could shut in the bees, except on very warm days.

Mr. Sturtivant said, in cold climates, bees were buried very profitably; and the greatest objection to doing so here, was the changeableness of our weather. He placed a number of stocks in a cellar last winter. Those that had a current of air passing through them, suffered with dysentery. He preferred to have his hives closed at the bottom, and well ventilated at the top; and, in his opinion, the great objection to burying bees, was the trouble of taking them out in the spring.

Mr. Flanders said that in the State of New York, bees were universally buried; but he thought it would be almost their destruction, if the springs were like the last.

Mr. Cunningham said he had no experience in burying bees, but would try it this winter. He had placed some in cellars. He thought hives should not be ventilated at the bottom.

Mr. Smith thought hives should have good ventilation at bottom, and little at top.

Mr. Eby thought he should bury most of his bees, and gave his experience in wintering in that manner.

Adjourned to two o'clock, P. M.

At two o'clock, P. M., the Vice President in the chair, the Convention took up the second question, viz: What is the best manner of feeding bees, in every form? The debate on this question, which was very interesting, was opened by Dr. Kirtland, and continued by Mr. Smith, Dr. Silvers, Mr. Sturtivant, Mr. Twining, Mr. Beebe, till half past four o'clock, when the subject was laid on the table, and the Convention adjourned to 9 o'clock next morning.

Nov. 22, at 9 A. M., the Vice President in the chair, the discussion of the pending question was resumed and concluded.

As a matter of privilege, Dr. Kirtland occupied the floor, and made a statement correcting some misrepresentations in regard to the object of this Association, and refuting some articles which appeared in the Prairie Farmer. After considerable discussion, the subject was, on motion of Mr. Flanders, referred to a committee—which consisted of Messrs. Flanders, Sturtivant, and Eby.

Mr. Brown offered the following resolutions, which were adopted:

1st. *Resolved*, that it be one of the standing rules of this Association, that all persons having improvements in bee hives, be invited to present them for investigation at any of the regular meetings of the Association.

2d. That the feeding of bees for any other purpose than prolonging their stores during a late season, or a bad spell of weather, is injurious and unprofitable; and that honey is the best and cheapest food, for that purpose, so far as known to this Association.

The Convention now took up as a third question,

THE HANDLING OF BEES,

and after some remarks had been made by Messrs. Robbison, Smith, Brown, and Sturtivant, adjourned till 2 o'clock, P. M.

At 2 P. M., the Vice President in the chair, the Committee on the statement submitted by Dr. Kirtland, reported as follows:

WHEREAS, the *Prairie Farmer* has imputed to the American Bee Association a disposition of selfishness on the part of its members, individually and collectively, and has attempted to stigmatize its members by ridicule, and held up this association to the public as an institution for the purpose of subserving certain individual interests only, *therefore*

Resolved, that this Association entirely repudiates any and every such charge made by the *Prairie Farmer*, or other publications, as being without foundation and *untrue*. And this Association do most cordially assure all that are willing to become members, that it is ever ready to do all in its power to advance the beekeeping interest everywhere, and invites them to join the Association.

And your Committee recommend that the proceedings of this meeting, together with its resolutions and the statement of its worthy President, be transmitted to the *American Bee Journal*, and other papers friendly to this Association, for publication.

W. A. Flanders,
E. T Sturtivant,
J. C. Eby,
Committee.

Debate was resumed by Dr. Kirtland and Mr. Twining, and when it was concluded, all persons present having hives on exhibition were invited to point out to the Convention the particular advantages of their inventions. In so doing,

Mr. Chopin presented the Bullard hive;

Mr. Flanders presented the Flanders hive;

Mr. Twining presented the Hartman & Metcalf hive.

On motion of Dr. Kirtland, it was unanimously *Resolved*, that this Association recommend the "AMERICAN BEE JOURNAL" to all beekeepers.

On motion of Mr. Brown, the Association adjourned to the fourteenth day of March, 1862, at 10 o'clock, A. M.

J. C. EBY,
Sec'y pro tem.

Dr. KIRTLAND'S STATEMENT.

MR. PRESIDENT:—As a matter of privilege, I claim the attention of this society for a few moments. Soon after the organization of this Association and its first meeting, several articles appeared in the *Prairie Farmer*, published at Chicago, designed to ridicule us as an association, and to satirize one of the most worthy and intelligent gentlemen who took an active part in that meeting. As those attacks were of a contemptible character, they were not deemed worthy of notice. But soon after our last meeting, that Journal again assailed us in a more open but calumnious form. Referring to our proceedings, the ostensible editor inquires—"*Whose Convention was it?*" and then goes on to insinuate that our society is only a body of selfish individuals, associated together and acting for a sinis er purpose. This is the substance of his attacks—perhaps his language is not exactly quoted, for I regret that the numbers of the Journal containing them, were accidentally destroyed. From correspondents in the further West, where the *Prairie Farmer* circulates extensively, I learn that it has diffused a general impression in that region, that the BEEKEEPERS' ASSOCIATION is actuated by the basest of motives.

As one of the individuals who acted in getting up this association, as one of its members, and its President from its origin up to the present time, I feel myself called upon to correct these false and erroneous attacks. To do it with facility and success, I will appeal to our proceedings. They show clearly that the sole design and object of our society is, and ever has been, to advance and benefit the pursuit of the apiarian. At our several meetings, matters relating to this pursuit have been introduced in order, and discussed, greatly not only to the instruction and benefit of those present, but to bee cultivators generally.

Our proceedings have, on all occasions, been governed by regularity and kindness, and every thing of an opposite tendency avoided. Every interest, every view, every patent, has been allowed a representation in our society. It is open to every one who chooses to join it and pay a trivial tax. Prominent points in bee culture are extensively examined and debated, with an eye solely to the attainment of knowledge. The rapid advancement made in this pursuit in this vicinity, is mainly due to this source. In the appointment of Committees, favoritism and partiality have been carefully avoided.

With equal propriety might the *Prairie Farmer* inquire—"*Whose is the* BEE JOURNAL?" That publication is established with the same object as our Society. Both are doing a great and good work.

☞ It takes about ½ lb. of comb to hold 15 lbs. of honey.

One gallon of honey weighs 12 lbs.

The least possible space for a *loaded* worker, is 5-32 of an inch.

5-32 of an inch will allow a loaded worker to pass, but will be too small for a *Queen*.

One pound of honey contains about 20 cubic inches.

AMERICAN BEE JOURNAL.

Philadelphia, December, 1861.

TO OUR FRIENDS.

With this number (which has been somewhat delayed from unavoidable causes), we conclude the first volume of the AMERICAN BEE JOURNAL, and now announce that the publication will be suspended for a year, to be then resumed if the state of the country will admit, and those interested in bee culture desire it. Until the unfortunate troubles in our national affairs culminated in actual collision, we had most gratifying evidence that the JOURNAL would receive the requisite patronage. But the general interruption of business subsequent to that event, and the rapid succession of important occurrences which properly absorbed public attention, interfered sadly with our prospects, and prevented those accessions to our subscription list which are indispensable to the successful establishment of a publication devoted to a specialty. The JOURNAL has been well received and well spoken of everywhere, and we have reason to believe that it has given general satisfaction to its readers; yet, as the times are not propitious, we have reluctantly concluded to suspend it. Among bees, the issue of natural swarms depends on the abundance of pasturage and the fitness of the season, and our *issues* must necessarily come under a similar category.

Our design was to impart a more practical character to the contents of the second volume. The elucidation of theory has hitherto occupied much of our space, as it seemed indispensable that the foundation of rational bee culture should be laid broad and deep; since, without it, practice must be, and continue to be, mere empiricism —with which no intelligent beekeeper can remain content. Having placed before the reader the views entertained on this branch of the subject by the most eminent naturalists and apiarians in Europe, a detail of the various practical processes adopted or recommended abroad as well as at home, would appropriately follow; and we trust there has been sufficient interest excited in behalf of this delightful department of rural economy, to warrant an early resumption of our labors.

☞ The first volume of the AMERICAN BEE JOURNAL is now completed, and will be sent free of postage on receipt of One Dollar.

Bees Botanizing.

Among the many singular traits which arrest and engage the attention of one who is studying the instincts of the bee, one of the most striking is the fact—noticed already in a general way by Aristotle—that, when gathering honey, each restricts itself, for the time being, to a single species of plants or flowers. So likewise, when gathering pollen, they are equally choice and chary; or rather, indiscriminate spoliation appears to be most carefully avoided when in pursuit of the latter, as if designedly to prevent the hybridization of plants. Still, in honey-gathering at least, occasional deviations from this habit have been observed and recorded—which may perhaps have been occasioned by pressing want, or the previous state of the weather. Mr. Stockmann saw each of two bees sipping nectar from the flowers of two different species of plants, on a fine day in June. Again, in July, he noticed a bee, after foraging awhile on the blossoms of wild sage, suddenly pass to those of a neighboring scabiosa. Closer observation enabled him to detect several others acting in the same manner. The bees had been long confined to their hives by rainy weather, when a sudden change enabled them to resort to the fields. Those thus irregularly gathering, may have belonged to ill-provided recent swarms; and prolonged abstinence, and great greed for honey, may have tempted them to a violation of their instinctive practice. On the following day, Mr. Stockmann again visited the place, and then found the bees scrupulously adhering each to its distinct class of flowers. Some were passing only from sage to sage; others only from scabiosa to scabiosa. —Mr. Hofman also observed bees, on one occasion, pass from white clover to corn-speedwell, thence returning to the clover. Others passed from *Polygala cruciata* to *Calendula officinalis*, and thence to *Viola tricolor*, before they returned to the *Polygala*. He neglects, however, to refer to the previous state of the weather; nor does he say whether these several kinds of plants were equally distributed there. The Polygala may have been the main crop and abundant, with only a few of the other kinds interspersed, though then yielding nectar very profusely, and thus tempting the eager gatherers to a momentary violation of what seems to be a law with them. Certainly, the ordinary practice of the bees is to restrict their visits, through the day, to that class of plants or flowers on which they, respectively, commence operations in the morning.

☞ 3660 workers will fill a quart measure.

Monthly Management.

DECEMBER.

If his stocks were carefully prepared for wintering during the mild weather in October and November, the beekeeper will not be called on to give only a general supervision from time to time, though if warm days occur, on which the bees can fly out, he may use the opportunity to inspect his hives more narrowly. Dead bees and droppings should then be removed from the bottom-board, as a precaution to prevent the entrance from becoming obstructed or closed. This should be done quietly and expeditiously, and only when the temperature is such as to allow bees to fly. Fowls must not be suffered to roost on or between the hives, nor should dogs, cats, or other domestic animals be tolerated about the apiary, especially during the winter. The less the bees are disturbed, at this season, when complete repose is so essential to them, the better. If the hives are situated on the north side of a fence or building, the bees will be less likely to be affected by transient changes of the weather, and in other locations, the front of the hives should, if as practicable, be sheltered from the sun's rays. A temporary screen will serve an excellent purpose, saving numbers of bees which would otherwise be tempted to issue and find themselves unable to return. Thin hives, whether made of straw or wood, will need some protection during very cold weather, in Northern districts; and where this seems necessary, it is always judicious to attend to it early in the season, so as not to disturb the colony when clustered in a semi-torpid state.

Bees kept in Langstroth hives, will require upward ventilation, especially if the stocks are strong. The mere removal of the tin coverings of the holes in the honey-board is not always sufficient to prevent the condensation of moisture within the hive, and the honey-board should then either be elevated about an inch, or entirely removed. If replaced by a frame of suitable size covered with canvas or coarse linen, sufficient ventilation may be furnished, and if the stock needs feeding, honey thickened with brown sugar and worked to a stiff doughy consistence, may be spread on the canvas immediately above the clustered bees, when it will be taken as required. If condensed moisture still collect within the top or cover of the hive, after the removal of the honey-board, (as sometimes happens with strong colonies) additional ventilation should be given by boring one or more ¾ inch holes through the sides of the cover. The entrance of the hives must, during this period, be kept so contracted as to allow the passage of only one bee at a time.

As a fit conclusion of these remarks on Monthly Management, now extending through the entire course of the year, we subjoin the following general axioms, extracted from "*Langstroth on the Hive and Honey Bee*" and which every new beginner in bee-keeping will do well to impress on his memory.

"1st. Bees gorged with honey never volunteer an attack.

2d. Bees may always be made peaceable by inducing them to accept of liquid sweets.

3d. Bees, when frightened by smoke, or by drumming, fill themselves with honey and lose all disposition to sting, unless they are hurt.

4th. Bees dislike any *quick* movements about their hives, especially any motion which *jars* their combs.

5th. Bees dislike the offensive order of sweaty animals, and will not endure impure air from human lungs.

6th. The beekeeper will ordinarily derive all his profits from stocks strong and healthy in early spring.

7th. In districts where forage is abundant only for a short period, the largest yield of honey will be secured by a *very* moderate increase of stocks.

8th. A moderate increase of colonies in any one season, will, in the long run, prove to be the easiest, safest, and cheapest mode of managing bees.

9th. Queenless colonies, unless supplied with a queen, will inevitately dwindle away, or be destroyed by the bee-moth or robber-bees.

10th. The formation of new colonies should ordinarily be confined to the season when bees are *accumulating* honey; and if this, or any other operation must be performed when forage is scarce, the greatest precaution should be used to prevent robbing.

The essence of all profitable bee-keeping is contained in Oettl's Golden Rule: KEEP YOUR STOCKS STRONG. If you cannot succeed in doing this, the more money you invest in bees, the heavier will be your losses; while if your stocks are strong, you will show that you are a bee-master, as well as a bee-keeper, and may safely calculate on receiving generous returns from your industrious subjects."

☞The average *weight* of workers (from four counts) is 4850 to a pound, avoirdupois.

1600 drones weigh about the same.